

## **DIVISION 4 MASONRY**

### **04000 MASONRY**

#### **PART 1 – GENERAL**

##### **1.1 WORK**

- A. Provide all related materials, equipment, and labor required to complete the work specified.
- B. Demolition and removal of existing masonry shall be in accordance with [Section 02050 Demolition](#) and as specified herein.
- C. All excavation, trenching, compaction, backfill, and landscaping shall be as listed in the **Scope** and as specified in [Section 02200 Excavation, Grading, and Backfill](#), and as specified herein.

##### **1.2 QUALITY OF WORK**

- A. Provide experienced, well-trained workers competent to complete the work as specified.
- B. All masonry materials shall be new from manufacturers and suppliers who specialize in masonry products.

##### **1.3 SUBMITTALS**

- A. Depending on the work listed in **Scope**, a building permit may be required. **Contractor** is responsible for obtaining all required permits from the City of Milwaukee DCD Development Center (809 N. Broadway, 1<sup>st</sup> Floor) prior to starting any work.
- B. **Contractor** shall, upon request of the **Inspector**, submit manufacturer's specifications to prove compliance with these **Specifications**.

##### **1.4 MATERIALS HANDLING**

- A. Deliver, store, and transport materials to avoid damage to the product or to any other work.
  - Return any product or materials delivered in a damaged or unsatisfactory condition.
- B. Store masonry materials:
  - Supported off the ground.
  - Protected from weather or moisture.
  - Protected from occupant and construction traffic.
  - Stored neatly with level support to prevent toppling.
  - Store metal connectors and fasteners in a dry location safe from physical damage.

##### **1.5 PRECONSTRUCTION AND PREPARATION**

- A. Examine and verify that job conditions are satisfactory for speedy and acceptable work.
- B. Confirm there is no conflict between this work and work of other trades.

#### **PART 2 – MATERIALS**

##### **2.1 MORTAR**

- A. Mortar as per manufacturer's instructions and as specified herein:
  - Type S.
  - Type M mortar for below grade applications
  - One part Portland cement.
  - One-half part lime.
  - Not more than four and one half parts sand, measured damp and loose.
  - Compressive strength of 1800 psi at 28 days.
- B. Masonry used below grade or subject to high lateral or compressive loads or severe frost should use Type M mortar, high strength mortar with 2500 psi compressive strength.
- C. No admixtures or curing materials will be allowed unless specifically approved for use by the mortar manufacturer.

- D. Mortar materials:
- Portland cement: Type I or II.
  - Aggregate: Clean, sharp sand.
  - Lime: Hydrated Type S.
  - Water: Clean and potable.

## 2.2 ACCESSORIES AND OTHER RELATED MATERIALS

- A. Install reinforcing and anchoring as required by code and as specified herein:
- Reinforcing bars: Grade 40, or as approved by the building code.
  - Deformed bars for No. 3 and larger.
  - Single wythe joint reinforcement: Truss type.
  - Multiple wythe joint reinforcement: Truss type with moisture drip.
  - Joint reinforcement: Unprotected cold-drawn steel.
  - Strap anchors: Bent steel, ¼" thick, galvanized.
  - Sheet metal wall ties: Corrugated galvanized steel.
  - Steel wire wall ties: Galvanized steel-formed wire.
  - Dovetail anchors: Bent strap, ¼" thick galvanized steel.
- B. All flashing shall be non-corrosive sheet metal.

## 2.3 BRICK MASONRY

- A. Provide brick masonry as listed in the **Scope** and as specified herein.
- B. New brick type, grade, and size shall match as closely as possible to original brick.
- C. Major brick foundation wall, facade, and column replacement shall require new brick as specified herein.
- D. Brick masonry maybe reused provided:
- Reused brick shall only be used for repairing or patching small areas of foundations, facade, guardrails, retaining walls, etc.
  - Reused brick is whole, intact and free of cracks or other defects.
  - Reused brick is cleaned prior to installation by completely removing old mortar and debris.

## 2.4 CONCRETE UNIT MASONRY (BLOCK)

- A. Provide new concrete unit masonry as listed in the **Scope** and as specified herein.
- B. Concrete unit masonry used for load bearing shall comply with the following:
- Grade and type shall be: Hollow, load-bearing units Grade N, Type I, Medium Weight.
  - Pattern and size to match as closely as possible to original.

# PART 3 – CONSTRUCTION AND INSTALLATION

## 3.1 WORK PREPARATION AND CONDITIONS

- A. All demolition work shall be in accordance with [Section 02050 Demolition](#) and as specified herein.
- Remove and dispose of existing masonry as indicated in the **Scope**.
  - Provide demolition materials, barriers, protective covers, etc. to complete the work assigned.
  - Install lead-based paint containment measures per [Section 01810 Lead Dust Hazards](#) and as specified herein when demolition will disturb painted or otherwise coated surfaces.
  - Contractor shall take all necessary precautions to minimize damage to building, other work and surrounding areas of the building, yard, etc.
- B. Examine site conditions and correct any conditions detrimental to the work.
- Do not do work when masonry might be harmed by rain, snow or low temperatures.
  - Verify that all necessary sub-grade preparation is completed.
  - Protect concrete masonry units from moisture, and keep them dry during installation.
- C. Cold weather:
- Masonry work shall be protected from frost or rapid drying.
  - No masonry or concrete footings shall be placed on or with frozen materials. Before placing masonry on older work, apply heat in such a manner that frost, ice, snow will be completely removed and

temperature of the surface is brought to a minimum temperature of 50 degrees F. Spreading of salts or chemicals on older work to remove ice and snow is not permitted.

- After the first frost and until the mean daily temperature falls below 40 degrees Fahrenheit for more than one day, freshly laid masonry shall be protected from freezing for not less than 72 hours after it is laid. Similarly protect in the spring.
- No masonry shall be laid when the temperature outside is below 40 degrees Fahrenheit, unless suitable means are provided and used to heat the newly completed work against damage or defacement from frost or freezing.
- When outside temperature drops below 40 degrees Fahrenheit, all masonry units and mortar intended for use shall be heated to a minimum temperature of 50 degrees F. and used when at a temperature of between 40 to 60 degrees F. The temperature of the separate mixing materials shall not exceed 150 degrees F.
- Masonry sand shall be heated to at least the minimum mortar temperature required above. The sand shall be heated slowly and evenly to prevent scorching. Scorched sand shall not be used in mortar.
- No anti-freeze or other ingredients shall be used to lower the freezing temperature of mortars. Admixtures except for those specified by the manufacturer are not allowed.
- All newly placed masonry shall be kept from freezing for a period of at least 72 hours (3 days) after it is laid.
- The **Contractor** shall supply temporary enclosures, artificial heat and such other protective methods as needed to protect masonry from cold temperatures.
- The **Contractor** is responsible for danger to workers and carbonization of masonry and concrete resulting from the use of salamanders or other heating devices, which directly exhaust CO gases.

### 3.2 WORK LAYOUT AND PREPARATION

#### A. Examine and layout work to establish and assure correct:

- Coursing and patterns.
- Elevation of base course.
- Opening sizes and locations.
- Sill and header heights and sizes.
- Location and sizing of beam pockets, or other openings.

#### B. Check and if necessary correct building structural members that support masonry to assure they are:

- Correctly located.
- Plumb.
- Aligned.
- Braced.
- Clean.

#### A. Install attachments that support masonry as required by building code or as specified herein.

#### B. Put in place, anchor, plumb and level metal work that will be embedded in masonry:

- Angles.
- Lintels.
- Bucks and frames.

#### C. Put appurtenances in place, anchoring them and protecting them from damage.

- Flashing and counter flashing.
- Expansion felt.
- Piping and conduit.
- Ductwork.
- Sleeves.

### 3.3 UNIT MASONRY INSTALLATION AND MORTAR APPLICATION

#### A. Lay masonry plumb, level, square, and true to line, matching existing workmanship, joints and bond.

- Rebuild walls, etc. to match the original design.
- Lay out work so minimum cutting is required, using only whole brick or block where possible.
- Where cutting is necessary, cut brick or block to neat, true line without chips on exposed faces.
- Conceal cut faces where possible.
- Do not lay brick or block less than 1/4" in length in exposed work.

- If any brick or block must be removed or shifted after it has been laid, remove setting mortar, clean brick or block thoroughly, apply fresh mortar and re-lay.
  - Solidly fill with mortar intersections between bricks or blocks and other materials.
  - Solidly fill joints and line pin holes.
- B. When brick or block laying has been delayed for more than one hour, clean masonry of exposed mortar, then wet by water spray when necessary.
- C. Amount of wetting depends on rate of absorption of brick or block at time of laying.
- When being laid, brick or block shall have a suction sufficient to hold mortar and absorb excess moisture, yet leave mortar sufficiently damp so it remains plastic enough to permit brick to be leveled and plumbed after being laid without breaking mortar bond.
- D. Mortar joints:
- Do mortar applications promptly.
  - Construct mortar joint sizes to match original joint style.
  - Provide full head and bed joints.
  - Properly butter masonry unit edges.
  - Completely fill joints: bed, cross, end, and head.
  - Do not tool joints prematurely before initial mortar set.
  - Tool joints without damaging mortar.
  - Promptly point holes, such as for line nails, as work proceeds.
  - Fully bed copings, blocks, and caps, and completely point joints.
  - Remove wedges as work progresses.
  - Repair defective units as work progresses.
  - Completely fill and level bed joints on lintels.
  - Lay brick or block courses in reference to a level line.
  - Align and plumb vertical joint lines in alternate courses.
  - Keep wall face plumb and aligned story by story.
- E. Install caulking, control joints, lintels, and flashing as listed in the **Scope**, required in building code, and as specified herein.
- Keep caulking spaces at window and doorframes uniform and of acceptable size.
  - Keep spaces for expansion/contraction control joints uniform and of acceptable size.
  - Recess window and door lintels from face of wall.
  - Tightly mortar chimney, parapet wall or other flashings into masonry work.
  - Repoint counterflashing after roofers have turned it back over base flashing.

### 3.4 TUCKPOINTING BRICK AND BLOCK

- A. Rake clean all mortar joints that are cracked and/or deteriorated as listed in the **Scope**.
- Rake clean to a point where solid, but to a minimum of ½ inch deep.
  - Tuckpoint cleaned joints with new mortar.
  - Strike all mortar joints to match existing joint style.
- B. Mortar (Type S or M) should be as listed herein.
- Mortar color shall match as closely as possible to existing.

### 3.5 MASONRY ACCESSORIES AND REINFORCING

- A. Provide and install metal ties for bonding as required by building code and as specified herein.
- Assure compliance in types, sizes, spacing, depth of anchoring, and corrosion resistance.

### 3.6 FOUNDATION PARGING AND WATERPROOFING

- A. Parge and waterproof foundation walls as listed in the **Scope**, required by the building code, or specified herein.
- Parging shall be smooth, consistent, and provide full coverage.
  - Parge or otherwise treat walls as required to receive backfill.
  - Do not backfill prior to proper curing of parging.
  - Use waterproofing manufacturer's recommended curing procedures.
- B. Backfill as indicated on the **Scope** and as specified in [Section 02200 Excavation, Grading, and Backfill](#).

### 3.7 WORK PROTECTION AND CLEANING

- A. Clean all surfaces during work and immediately upon completion:
  - Don't allow mortar to enter expansion joints.
  - Don't allow any mortar droppings on sills, copings, and projecting courses.
  - Scrape mortar extrusions off inside wall.
  - Clean mortar droppings from brick, anchors and straps, to avoid water bridges.
  - Clean or replace any finished brick or block damaged by spilled concrete or mortar.
- B. Clean work site, and completely remove debris and excess material from site.

### 3.8 REPAIR

- A. After installation, inspect all work for improper installation or damage.
- B. Repair or replace work not in compliance with the **Scope** or these **Specifications**.
  - Repairs shall be made at the direction of the **Inspector**.
  - Repairs shall be made at the **Contractor's** expense.
  - Repair work should be undetectable.
- C. **Contractor** shall make all repairs necessary to restore **Owner's** property and any adjacent properties damaged as a result of the **Contractor's** work.

END OF SECTION – 04000 MASONRY